India are reproduced; the original seeds which were obtained in South America were sown at Kew, and the young plants sent thence to the East, but the precarious nature of the undertaking may be inferred from the fact that only about three per cent. of the seeds germinated. It is pleasant to read here and there spontaneous testimony to the value of the Royal Gardens at Kew and of the Indian Botanic Gardens.

Of controversial subjects the coffee leaf disease attracted most notice, considerable space being devoted to the reports and letters of Mr. Marshall Ward, and to the discussions arising therefrom. On p. 15 is a complacent suggestion that as crops cannot always be got from the branches of the coffee tree they might be got in another form from the roots by grinding up the cockchafers that there abound and selling the beetle powder, mixed with a little coffee, as real coffee, carrying on the entire manufacture in Ceylon to prevent any tampering on the part of dishonest middlemen in London! This pleasant notion is based on the assumption that "the British public will consume anything not absolutely dirt that is sufficiently adulterated to suit their palates."

The marked contrast between our home agriculture and that of the tropics is afforded in the very few and scanty references to live stock of any kind. English agriculturists are continually relying more and more on their flocks and herds and less on their corn crops for remunerative returns. There is, indeed, a solitary reference to Aden cattle, which are bred inland, and derive their name only from the port whence they are shipped. They have a high reputation as dairy stock, and have been used with success for crossing with some of the Indian herds on the Government farm at Saidapet, Madras. The only allusion to sheep-farming is to that of Australia.

Of course, in such a volume as the one before us, the matter is necessarily of a very heterogeneous character, but it is all concerned more or less directly either with agriculture itself, or with the economic and industrial aspects of the art as pursued in the hotter regions of the globe. As a record of the experience of tropical planters, of the difficulties and drawbacks of climate and of soil they have to contend with, of the good or indifferent results which have attended their efforts at acclimatisation, of the measures they have adopted to minimise the evil effects of insect or fungal attacks, and not less as an interesting historical summary of the progress of tropical agriculture, such a work as this carried out on the lines on which it has been begun cannot fail to possess a permanent value. Young men especially, who, having learnt something of the art of agriculture in the stern school of British farming, would fain try their skill under a tropical sun, will find collected here a large mass of useful information such as perhaps it would hardly be possible to obtain elsewhere. W. FREAM

OUR BOOK SHELF

Vorlesungen über Pflanzen-physiologie. Von Julius Sachs. (Leipzig: Wilhelm Engelmann, 1882-83.)

THE fourth edition of Prof. Sachs's well-known text-book of botany being nearly exhausted, his friends and publishers urged him to set about the preparation of a new edition; but the revisal necessary for the publication of the fourth edition had been so irksome that nothing would induce the author to attempt the task again. Moreover his views on many important questions concerning the physiology of plants had changed: points once considered all-important had lost much of their importance, and expanded views acquired in the progress of time could not be made to fit into the framework of the old work.

Prof. Sachs for years has been a most successful teacher of botany. His text-book, large and technical though it was, has had a most successful career in German-speaking countries; translated into French by an eminent French botanist, and into English under the auspices of the Delegates of the Clarendon Press at Oxford, there needed no higher testimonies to its worth; still, instead of being content with the success of his volume, he now refuses to look at it, and utterly casts it from him. "As long as the artist is pleased with his work, he can add a touch here and there, or can even go in for greater changes; but this is not sufficient when the work has ceased to be the expression of his idea, and this is the attitude I stand in with regard to my text-book." This state of mind has resulted in the publication of the fine volume which we now notice; in size and general appearance it differs very little from the author's text-book, but under the style of lectures it appeals to a wider circle of readers than mere college students. Ardently anxious that the very important modern views on plant physiology should be known to all fairly educated people, these lectures, without sacrificing scientific accuracy, are written in a style as free as possible from the fatiguing use of long and purely technical words; they are purposely written too in a slightly dogmatic style, for it is clearly a lecturer's duty to put before his audience his own individual views upon even debated questions; his hearers have a perfect right to know what impresion the general aggregate of scientific facts has made upon his mind, and while this would be out of place in a technical text-book of the science, it harmonises well with a course of lectures.

At the end of each lecture some—we could have wished for more—bibliographical notes are added for the benefit of those readers who wish to plunge deeper into the subject.

The publishers wished that a new revised edition of the systematic part of the text-book should have been "tagged" on to these lectures, but Prof. Sachs declared that he had neither time nor inclination for the task, which he commits to the care of Prof. Gœbel, whose separate treatise on this part of the subject has lately made its appearance. We hope the day may not be far off when these charming lectures on plant physiology will be read in English by a large number of our cultivated public. E. P. W.

Accented Five-figure Logarithms of Numbers from 1 *to* 99999 *without Differences.* Arranged and Accented by L. D'A. Jackson. (London: W. H. Allen, 1883.)

IN this work are comprised two sets of tables. The first set (pp. 1–221) is indicated by the above title-page; the second is entitled "Accented Five-figure Logarithms of Sines, Tangents, Cotangents, and Cosines of Angles from 0° to 90° to every Hundredth of a Degree" (pp. 224–270). There is, further, a one-page "Comparison of French and English Decimal Scientific Systems at 32° and 39° Fahrenheit in vacuo." The possessors of the same author's "Accented Four-figure Logarithms" are already acquainted with his principles of accentuation; to those who have not this work we need only say that *excess* and *defect* are clearly indicated in the printing, and that the degree of accuracy attainable in any piece of calculation is very rarely inferior to that reached by the longer calculations with the ordinary seven-figure tables. The logarithm of any number is seen at a glance, so that there

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is no using of differences, proportional parts, or antilogarithms. In his introduction the author works out some examples with ordinary unaccented five and seven-figure tables, and with these accented tables. On the hypothesis that the tables are correctly printed—we have detected no error—we commend this book as being one that will save much time in calculation without entailing a loss of accuracy. The figures are very clearly printed.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

The Earthquake of Ischia

In NATURE, August 30, p. 414, a correspondent remarks: "The recent catastrophe in the Island of Ischia has called the attention of those who make a study of such disturbances of the earth's surface to the simultaneous occurrence of earthquakes in various parts of the world"; while in NATURE of August 16, p. 368, Mr. Milne, in his article on "Earth Pulsations," says: "The directions in which these tips of the soil take place, which phenomena are noticeable in seismic as well as microseismic motions, Rossi states are related to the directions of certain lines of faulting."

With a view to call attention to the connection between earthquakes occurring in different parts of the globe, either simultaneously or successively, I submitted to the British Association at Swansea a paper on the relation between coast-line directions and local ties in Europe marked by frequency of earthquakes, as also a map illustrative thereof. In this paper, and in a previous one published in the *Transactions of the Royal Irish Academy*, I started with, and endeavoured to prove, the principle laid down by Rossi as to the connection between lines of faulting and earthquake movements, and the map submitted tended to show this relation as being very marked for certain lines of direction.

I now beg leave to call attention to the following lines of action shown thereon in relation with the Ischia earthquake. Amongst the lines cited were those of the *east coast of Sweden* and *east coast of Sardinia*, both nearly parallel, and thereon marked. As regards the first, I state in the memoir (p. 508 of the *Proceedings of the Royal Irish Academy*, 2nd series, vol. iii.; *Science*, No. 8, May, 1882):—

"The section of this line between Rome and Rimini is one of the best marked earthquake lines in Italy, whilst the section between Pola and Brück is also well defined as a direction by a series of points along which shocks have been continually occurring." I further add: "Between Palermo and Naples a parallel to this coast-line seems to be marked by earthquake movements cited as having extended from one point to the other (April 16, 1817)." Now this line passes precisely at Ischia, and, being extended, passes at or near the following places noticeable for earthquakes:—

Corleone, Palermo, Ischia, Teano, Isernia, Lanciana, Grossa Island, Neustadt (Carmola), Marburg, Semering Pass, Neuburg (near Vienna), Znaïm, Glatz, Breslau. Its prolongation represents the axis of the Baltic and the coast-line of Finland from Nystad to Biorniborg.

The west coast of Sicily furnishes a parallel to this direction, and on it are the following earthquake points:—

Frosinone, Aquila, Aseoli, Laybach, Hirschberg, the Riesengebirge, Glogau, and quite recently (May) the points in Finland—Nykerleby, Wasa, and Itterseppo.

Although unacquainted with the geology of the countries traversed by these directions, I am convinced that there occurs marked jointing both in Sicily and in Italy corresponding to the direction of these lines, about N. 10° 30′ E.

It seems to me that they furnish a means of connecting these phenomena, and that they allow of some approach being made to the determination of the laws which govern the occurrence of earthquakes in these parts of Europe. J. P. O'REILLY

Mr. Romanes and Modern Philosophy

AS an adherent of the school of thought which Mr. G. J. Romanes (NATURE, vol. xxviii. p. 387) has subjected to such a spirited criticism, I may perhaps be allowed to make a few comments upon his position.

If all science, at least all that has outgrown the mere registration of facts, consists in the application to the latter of certain necessary principles of thinking, it is at least possible that philosophy—an important part of whose function is the systematic elucidation of these principles—may be of some use in scientific procedure.

Mr. Romanes, if he accepts the fact that nature is an object of knowledge, cannot deny that it is governed by the essential conditions of knowing. It is usual, but hardly fair, to confound such obvious statements with the subjective idealism which "makes the universe revolve round the philosopher." A necessary principle is one that evidently does not apply simply to the experience of a single man, a corollary that ought to save much confusion concerning the relations between mind and matter. If, too, it had been recognised that such principles admit of no ulterior possibilities, we would have been spared the controversy anent non-Euclidean space.

With regard to their application to facts of experience, or conceptions derived from these, it may be remembered that the sciences in whose results we place the most confidence—*e.g.* mathematics, mathematical physics, and astronomy, are chiefly deductive. With regard to the portions of these which apparently consist of empirical generalisations, it should not be impossible to show that they, in common with the whole of mathematical science, really flow from the constitution of our experience of nature.

In dealing with the question of mechanism and teleology it is a common error to think that in using the higher categories there is any supersession of such principles as those of cause and effect. As objects of outer experience, organisms are certainly conditioned by the latter; but when they are regarded as subjects, as well as objects, we are compelled to recognise the one-sidedness of such categories—to read into them, as it were, our own active subjectivity. Even the most dogmatic materialist might suspect that the conception of cause and effect is not adequate to a complete solution of the problems presented by living beings. In accepting causality, then, as a truth of universal application, it is not in any sense unscientific to regard it as merely one among the principles which regulate nature.

With regard to the special applications of teleology (in the philosophical sense), it is easy to find instances of incorrect deduction, because of the undeveloped condition of this portion of the subject. Treatises upon it can therefore only be considered as suggestive. Mr. Romanes seems to fear that such efforts will create a dogmatism fatal to scientific progress, although he is aware that the tendency of the times is in exactly the reverse direction. The *a priori* of modern philosophy is of a far different nature from that of scholasticism, and may be in many cases quite as scientific as that which determines the impossibility of perpetual motion, or prophesies a transit of Venus.

Crewe, August 30 ALFRED STAPLEY

Animal Intelligence

THE columns of NATURE have sometimes been open to statements illustrating the practical sagacity of animals of the lower classes. Allow me to place before you the history of an occurrence which appears to prove the power of organisation in the common house-mouse.

The room to which I shall refer is one of several which were built as additions to the original house; it was used solely as a bedroom. I think it very probable that the old and the new apartments were so united that there was no clear mouse-way between them.

I had been sleeping alone in the room, I believe for several weeks, without any disturbance. One night I was woke up, I believe some hours after midnight, by such a grinding under the floor as I never heard before. It was evidently useless for me to attempt to interrupt it, and indeed I was rather curious to observe what would ultimately happen, and I lay quiet in bed. Daylight approached, and still the grinding continued. At last the noise suddenly ceased, and in a minute the room seemed to be filled with mice, running about in every direction. I did not, however, perceive that they mounted the bed or the bed-furniture. At last I perceived a mouse ascending the wall. In my full

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